Space Weather Forecast

Issued on Wednesday, 10 January 2024 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Ongoing chance of isolated Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low solar activity with a number of Common class flares from across the disc. There are eleven sunspot regions, dominated by two clusters. In first in the western/north-western disc consists of a number of moderately sized region showing some limited development. The other cluster consists of two sunspots close together in the southeast, both of which are showing little change, and overall also remain relatively stable. A single large region has rotated onto the southeastern hemisphere, currently appearing as a simple spot. There is an as yet unnumbered region which has developed fairly rapidly in the southeast. This region will be watched closely for further developments.

Between approximately 09/1400-1600UTC a large double filament (loop of plasma) liftoff was observed in the southeast disk, the westernmost portion of which perhaps giving a slight chance of glancing Earth influence into Day 4 (13 Jan), low confidence however and we await further modeling output. No other Earth-directed CMEs (coronal mass ejections) were observed in the last 24 hours in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds showed a weak enhancement likely due to a weak faster wind connection. Wind speeds were at background levels, but slowly increased from around 320 km/s to near 400 km/s. Interplanetary magnetic field (IMF) has been mostly weak but with a couple of brief moderate peaks. The north-south component has varied weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) were just very slightly elevated, but well below the level of a minor radiation storm (S1).

Four-Day Space Weather Forecast Summary

Solar Activity: There is an ongoing chance of isolated Moderate flares with a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: There are two potential glancing CME impacts, one from 06 Jan, perhaps bringing a glancing influence early Day 1 (10 Jan), and another from 09 Jan, potentially arriving Day 4 (13 Jan). However these are both low confidence. Otherwise some slight interaction with faster solar wind remains possible Day 1 (10 Jan), but this is likely to have only a very limited impact. Quiet geomagnetic conditions are expected to persist for much of the period, but may rise to Unsettled with a chance of Active in association with any glancing CME arrival.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to continue gradually easing, likely persisting well below the level of a minor

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radiation storm (S1). However there is a slight chance of further increases, should there be any notable flare activity.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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